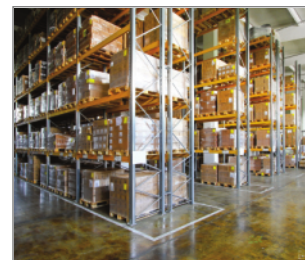


R-KER II Hybrid resin with Sockets

High strength and versatile application in cracked and non-cracked concrete with internally threaded sockets (ITS)

Approvals and Reports

• ETA-17/0594



Product information

Features and benefits

- Approved for use in cracked and non-cracked concrete
- Allows removal of bolt to leave a re-usable socket in place
- Winter version can be used in warmer temperatures for faster curing
- Suitable for use in dry and wet substrates as well as holes and substrates covered with water
- Rapid bonding time enables quick execution of works
- Very high load capacity
- Anchor does not generate tensions in the substrate which enables R-KER to be specified where closer edge and spacing distances are required
- Suitable for multiple use. Partly used product can be reused after fitting new nozzle

Applications

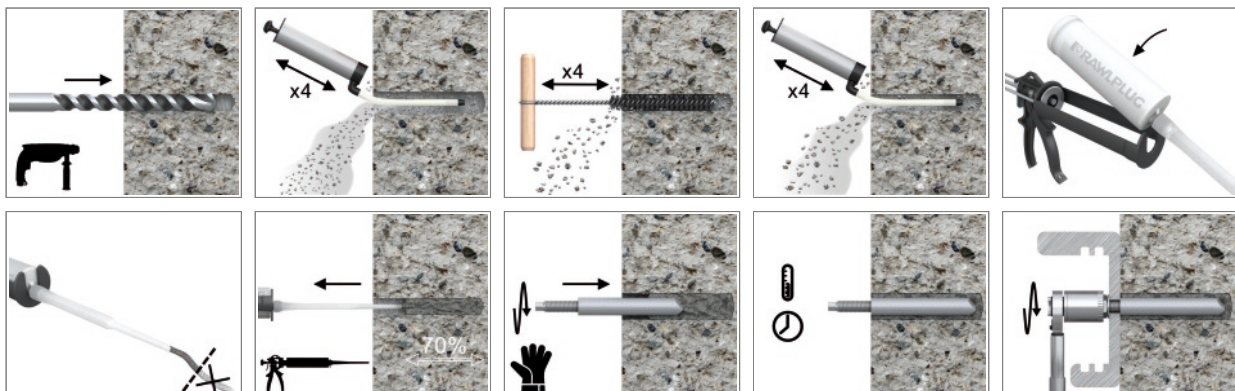
- Curtain walling
- Balustrading
- Handrails
- Canopies

Base materials

Approved for use in:

- Non-cracked concrete C20/25-C50/60
- Cracked concrete C20/25-C50/60

Installation guide



Product information

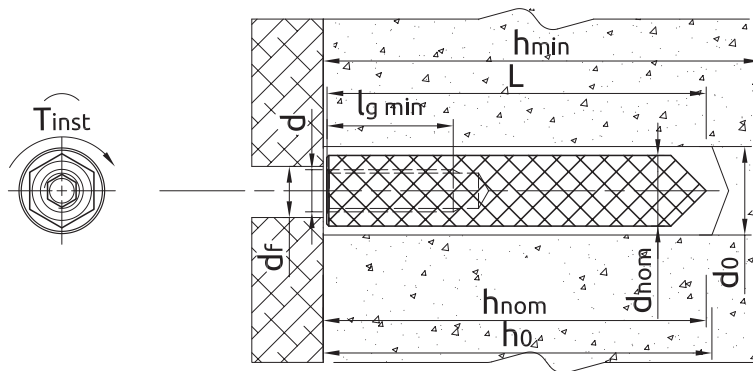
1. Drill hole to the required diameter and depth for socket size being used.
2. Clean the drill hole thoroughly with brush and hand pump at least four times before installation
3. Insert cartridge into gun and attach nozzle.
4. Dispense to waste until even colour is obtained (min. 10 cm)
5. Insert the mixer nozzle to the bottom of the drill hole and inject resin, slowly withdrawing the nozzle as the hole is filled to 70% of its depth.
6. Immediately insert the socket, slowly and with slight twisting motion. Remove any excess resin around the hole before it sets and leave it undisturbed until the curing time elapses.
7. Attach fixture and tighten the bolt to the required torque.

Product Code	Resin	Description / Resin Type	Volume
			[ml]
R-KER-II-300	R-KER-II	R-KER II Hybrid Resin	300
R-KER-II-345			345
R-KER-II-400			400
R-KER-II-300-S	R-KER-II-S	R-KER II Hybrid Resin for High Temperature (Summer) / Slow Cure Styrene Free Hybrid Resin	300
R-KER-II-400-S			400
R-KER-II-300-W	R-KER-II-W	R-KER II Hybrid Resin for Low Temperature (Winter) / Rapid Cure Styrene Free Hybrid Resin	300
R-KER-II-345-W			345
R-KER-II-400-W			400

SOCKETS

Size	Product Code		Anchor			Fixture	
	Steel class 5.8	Steel grade A4	Socket diameter	Length	Internal thread length	Hole diameter	
			d	L	l _s	d _f	d _i
			[mm]	[mm]	[mm]	[mm]	[mm]
M6	R-ITS-Z-06075	R-ITS-A4-06075	10	75	24	7	-
M8	R-ITS-Z-08075	R-ITS-A4-08075	12	75	25	9	14
	R-ITS-Z-08090	R-ITS-A4-08090	12	90	25	9	-
M10	R-ITS-Z-10075	R-ITS-A4-10075	16	75	30	12	-
	R-ITS-Z-10100	R-ITS-A4-10100	16	100	30	12	-
M12	R-ITS-Z-12100	R-ITS-A4-12100	16	100	35	14	-
M16	R-ITS-Z-16125	R-ITS-A4-16125	24	125	50	18	-

Installation data



SOCKETS

Size			M6	M8		M10		M12	M16
Min. installation depth	h_{nom}	[mm]	75	75	90	75	100	100	125
Thread diameter	d	[mm]	6	8	8	10	10	12	16
Hole diameter in substrate	d_0	[mm]	12	14	14	20	20	20	28
Hole diameter in fixture	d_f	[mm]	7	9	9	12	12	14	18
Thread engagement length	h_s	[mm]	24	25	25	30	30	35	50
Min. hole depth in substrate	h_0	[mm]	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$	$h_{nom} + 5$
Min. substrate thickness	h_{min}	[mm]	$h_{nom} + 30$ ≥ 100	$h_{nom} + 30$ ≥ 100	$h_{nom} + 30$ ≥ 100	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$	$h_{nom} + 2d_0$
Installation torque	T_{inst}	[Nm]	3	5	5	10	10	20	40
Min. spacing	s_{min}	[mm]	40	40	50	40	50	50	70
Min. edge distance	c_{min}	[mm]	40	40	50	40	50	50	70

Minimum working and curing time

R-KER-II

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	0	3 h	30
5	5	90	15
10	10	60	8
15	15	60	5
20	20	45	2.5
25	25	45	2
25	30	45	2
25	35	30	1.5
25	40	30	1.5

*For wet concrete the curing time must be doubled

R-KER-II S

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	5	12 h	40
10	10	8 h	20
15	15	6 h	15
20	20	4 h	10
25	25	3 h	9.5
25	30	2 h	7
25	35	2 h	6.5
25	40	1.5 h	6.5

*For wet concrete the curing time must be doubled

Installation data

R-KER-II W

Resin temperature	Concrete temperature	Curing time*	Working time
[°C]	[°C]	[min]	[min]
5	0	2 h	14
5	5	60	9
10	10	45	5.5
15	15	30	3
20	20	15	2
25	25	10	1.5
25	30	10	1.5
25	35	5	1
25	40	5	1

*For wet concrete the curing time must be doubled

Mechanical properties

Size			M6	M8	M10	M12	M16
R-ITS-Z Internally Threaded Sockets							
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	520	500	500	500	500
Nominal yield strength - tension	f_{yk}	[N/mm ²]	420	400	400	400	400
Cross sectional area - tension	A_s	[mm ²]	20	37	58	84	157
Elastic section modulus	W_{el}	[mm ³]	21	50	98	170	402
R-ITS-A4 Internally Threaded Sockets							
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm ²]	700	700	700	700	700
Nominal yield strength - tension	f_{yk}	[N/mm ²]	350	350	350	350	350
Cross sectional area - tension	A_s	[mm ²]	20	37	58	84	157
Elastic section modulus	W_{el}	[mm ³]	21	50	98	170	402
Metric Threaded Rods - Steel Class 5.8							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	8	19	37	65	166
Design bending resistance	M	[Nm]	6	15	30	52	133
Allowable bending resistance	M_{rec}	[Nm]	5	11	21	37	95
Metric Threaded Rods - Steel Class 8.8							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	12	30	60	105	266
Design bending resistance	M	[Nm]	10	24	48	84	213
Allowable bending resistance	M_{rec}	[Nm]	7	17	34	60	152
Metric Threaded Rods - A4							
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	11	26	52	92	233
Design bending resistance	M	[Nm]	7	17	34	59	149
Allowable bending resistance	M_{rec}	[Nm]	5	12	24	42	107

Basic performance data

SOCKETS

Performance data for single anchor without influence of edge distance and spacing - ETAG 001

Size		M6	M8		M10		M12	M16	M6	M8		M10		M12	M16
Substrate		Non-cracked concrete							Cracked concrete						
Effective embedment depth h_{ef} [mm]		75.0	90.0	75.0	100.0		125.0		75.0	90.0	75.0	100.0		125.0	
MEAN ULTIMATE LOAD															
TENSION LOAD $N_{Ru,m}$															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	12.5	21.6	21.6	34.8	34.8	50.4	100.1	12.5	21.6	21.6	28.1	34.8	43.2	45.2
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	19.2	34.8	34.8	39.4	55.2	60.6	100.1	19.2	28.1	34.8	28.1	43.2	43.2	45.2
METRIC THREADED RODS - A4	[kN]	16.8	31.2	31.2	39.4	49.2	60.6	100.1	16.8	28.1	31.2	28.1	43.2	43.2	45.2
SHEAR LOAD $V_{Ru,m}$															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.00	10.8	10.8	16.8	16.8	25.2	46.8	6.00	10.8	10.8	16.8	16.8	25.2	46.8
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	9.60	18.0	18.0	27.6	27.6	40.8	75.6	9.60	18.0	18.0	27.6	27.6	40.8	75.6
METRIC THREADED RODS - A4	[kN]	8.40	15.6	15.6	24.0	24.0	34.8	66.0	8.40	15.6	15.6	24.0	24.0	34.8	66.0
CHARACTERISTIC LOAD															
TENSION LOAD N_{Rk}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	10.00	18.0	18.0	29.0	29.0	42.0	70.6	10.00	18.0	18.0	23.4	29.0	36.0	37.7
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	16.0	29.0	29.0	32.8	46.0	50.5	70.6	16.0	23.4	29.0	23.4	36.0	36.0	37.7
METRIC THREADED RODS - A4	[kN]	14.0	25.0	25.0	32.8	40.0	50.5	70.6	14.0	23.4	25.0	23.4	36.0	36.0	37.7
SHEAR LOAD V_{Rk}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	5.00	9.00	9.00	14.5	14.5	21.0	39.0	5.00	9.00	9.00	14.5	14.5	21.0	39.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	8.00	14.5	14.5	23.0	23.0	33.5	62.5	8.00	14.5	14.5	23.0	23.0	33.5	62.5
METRIC THREADED RODS - A4	[kN]	7.00	12.5	12.5	20.0	20.0	29.5	54.5	7.00	12.5	12.5	20.0	20.0	29.5	54.5
DESIGN LOAD															
TENSION LOAD N_{Rd}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	6.67	12.0	12.0	19.3	19.3	28.0	47.1	6.67	12.0	12.0	15.6	19.3	24.0	25.1
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	10.7	19.3	19.3	21.9	30.7	33.7	47.1	10.7	15.6	19.3	15.6	24.0	24.0	25.1
METRIC THREADED RODS - A4	[kN]	7.49	13.4	13.4	21.4	21.4	32.6	47.1	7.49	13.4	13.4	15.6	21.4	24.0	25.1
SHEAR LOAD V_{Rd}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.00	7.20	7.20	11.6	11.6	16.8	31.2	4.00	7.20	7.20	11.6	11.6	16.8	31.2
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	6.40	11.6	11.6	18.4	18.4	26.8	50.0	6.40	11.6	11.6	18.4	18.4	26.8	50.0
METRIC THREADED RODS - A4	[kN]	4.49	8.01	8.01	12.8	12.8	18.9	34.9	4.49	8.01	8.01	12.8	12.8	18.9	34.9
RECOMMENDED LOAD															
TENSION LOAD N_{rec}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	4.76	8.57	8.57	13.8	13.8	20.0	33.6	4.76	8.57	8.57	11.1	13.8	17.1	18.0
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	7.62	13.8	13.8	15.6	21.9	24.1	33.6	7.62	11.1	13.8	11.1	17.1	17.1	20.0
METRIC THREADED RODS - A4	[kN]	5.35	9.55	9.55	15.3	15.3	22.5	33.6	5.35	9.55	9.55	11.1	15.3	17.1	18.0
SHEAR LOAD V_{rec}															
METRIC THREADED RODS - STEEL CLASS 5.8	[kN]	2.86	5.14	5.14	8.29	8.29	12.0	22.3	2.86	5.14	5.14	8.29	8.29	12.0	22.3
METRIC THREADED RODS - STEEL CLASS 8.8	[kN]	4.57	8.29	8.29	13.1	13.1	19.1	35.7	4.57	8.29	8.29	13.1	13.1	19.1	35.7
METRIC THREADED RODS - A4	[kN]	3.21	5.72	5.72	9.16	9.16	13.5	25.0	3.21	5.72	5.72	9.16	9.16	13.5	25.0

Design performance data

SOCKETS

Size			M6	M8		M10		M12	M16
Effective embedment depth	h_{ef}	[mm]	75.00	75.00	90.00	75.00	100.00	100.00	125.00
TENSION LOAD									
STEEL FAILURE; STEEL CLASS 5.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	10.00	18.00	18.00	29.00	29.00	42.00	78.00
Partial safety factor	γ_{Ms}	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50
STEEL FAILURE; STEEL CLASS 8.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	16.00	29.00	29.00	46.00	46.00	67.00	125.00
Partial safety factor	γ_{Ms}	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50
STEEL FAILURE; STEEL GRADE A4-70									
Characteristic resistance	$N_{Rk,s}$	[kN]	14.00	25.00	25.00	40.00	40.00	59.00	109.00
Partial safety factor	γ_{Ms}	-	1.87	1.87	1.87	1.87	1.87	1.87	1.87
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (40°C/24°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	11.00	14.00	14.00	11.00	11.00	11.00	8.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	11.00	14.00	14.00	11.00	11.00	11.00	8.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; NON-CRACKED CONCRETE, C20/25 (120°C/80°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	6.00	7.00	7.00	6.00	6.00	6.00	4.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, C20/25 (40°C/24°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	10.00	10.00	10.00	9.50	9.50	9.00	4.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, C20/25 (80°C/50°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	10.00	10.00	10.00	9.50	9.50	9.00	4.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE; CRACKED CONCRETE, C20/25 (120°C/80°C)									
Characteristic bond resistance	T_{Rk}	[N/mm ²]	5.00	6.00	6.00	5.00	5.00	5.00	2.00
COMBINED PULL-OUT AND CONCRETE CONE FAILURE									
Installation safety factor	γ_2	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Increasing factors for $N_{Rd,p}$ - C30/37	ψ_c	-	1.04	1.04	1.04	1.04	1.04	1.04	1.00
Increasing factors for $N_{Rd,p}$ - C40/50	ψ_c	-	1.07	1.07	1.07	1.07	1.07	1.07	1.00
Increasing factors for $N_{Rd,p}$ - C50/60	ψ_c	-	1.09	1.09	1.09	1.09	1.09	1.09	1.00
CONCRETE CONE FAILURE									
Installation safety factor	γ_2	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Factor for cracked concrete	k	-	7.20	7.20	7.20	7.20	7.20	7.20	7.20
Factor for cracked concrete	$k_{cr,N}$	-	7.70	7.70	7.70	7.70	7.70	7.70	7.70
Factor for non-cracked concrete	k	-	10.10	10.10	10.10	10.10	10.10	10.10	10.10
Factor for non-cracked concrete	$k_{ucr,N}$	-	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Edge distance	$c_{cr,N}$	[mm]	1.5* h_{ef}	1.5* h_{ef}	1.5* h_{ef}	1.5* h_{ef}	1.5* h_{ef}	1.5* h_{ef}	1.5* h_{ef}
Spacing	$s_{cr,N}$	[mm]	3.0* h_{ef}	3.0* h_{ef}	3.0* h_{ef}	3.0* h_{ef}	3.0* h_{ef}	3.0* h_{ef}	3.0* h_{ef}
CONCRETE SPLITTING FAILURE									
Installation safety factor	γ_2	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Design performance data

Size			M6	M8	M10	M12	M16		
SHEAR LOAD									
STEEL FAILURE; STEEL CLASS 5.8									
Characteristic resistance without lever arm	V _{Rk,s}	[kN]	5.00	9.20	9.20	14.50	14.50	21.10	39.30
Characteristic resistance with lever arm	M _{Rk,s}	[Nm]	7.60	18.70	18.70	37.40	37.40	65.50	166.50
Partial safety factor	γ _{Ms}	-	1.25	1.25	1.25	1.25	1.25	1.25	1.25
STEEL FAILURE; STEEL CLASS 8.8									
Characteristic resistance without lever arm	V _{Rk,s}	[kN]	8.00	14.60	14.60	23.20	23.20	33.70	62.80
Characteristic resistance with lever arm	M _{Rk,s}	[Nm]	12.20	30.00	30.00	59.80	59.80	104.80	266.40
Partial safety factor	γ _{Ms}	-	1.25	1.25	1.25	1.25	1.25	1.25	1.25
STEEL FAILURE; STEEL GRADE A4-70									
Characteristic resistance without lever arm	V _{Rk,s}	[kN]	7.00	12.80	12.80	20.30	20.30	29.50	55.00
Characteristic resistance with lever arm	M _{Rk,s}	[Nm]	10.70	26.20	26.20	52.30	52.30	91.70	233.10
Partial safety factor	γ _{Ms}	-	1.56	1.56	1.56	1.56	1.56	1.56	1.56
CONCRETE PRY-OUT FAILURE									
Factor	k	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Installation safety factor	γ ₂	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CONCRETE EDGE FAILURE									
Anchor diameter	d _{nom}	[mm]	10.00	12.00	12.00	16.00	16.00	16.00	24.00
Effective length of anchor	ℓ _f	[mm]	min (h _{ef} ; 8d _{nom})	min (h _{ef} ; 8d _{nom})	min (h _{ef} ; 8d _{nom})	min (h _{ef} ; 8d _{nom})	min (h _{ef} ; 8d _{nom})	min (h _{ef} ; 8d _{nom})	min (h _{ef} ; 8d _{nom})
Installation safety factor	γ ₂	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Combined pull-out and concrete cone failure (TR 029, p.5.2.2.3. acc. to formula 5.2a - $N_{Rk,p}^0 = n \cdot d \cdot h_{ef} \cdot \tau_{Rk}$).

Concrete cone failure (TR 029, p.5.2.2.4. acc. to formula 5.3a - $N_{Rk,c}^0 = k_1 \cdot F_{ck,cube}^{0.5} \cdot h_{ef}^{1.5}$).

$h_{ef} = h_{nom}$

Product commercial data

Product Code	Volume [ml]	Quantity [pcs]			Weight [kg]			Bar Codes
		Box	Outer	Pallet	Box	Outer	Pallet	
R-KER-II-300 ¹⁾	300	10	10	840	5.9	5.9	525.6	5906675293738
R-KER-II-345 ¹⁾	345	10	10	840	7.6	7.6	668.4	5906675395203
R-KER-II-400 ¹⁾	400	10	10	560	8.2	8.2	489.2	5906675392103
R-KER-II-300-S ¹⁾	300	10	10	840	5.9	5.9	525.6	5906675432045
R-KER-II-400-S ¹⁾	400	10	10	560	8.2	8.2	489.2	5906675432076
R-KER-II-300-W ¹⁾	300	10	10	840	5.9	5.9	525.6	5906675432038
R-KER-II-345-W ¹⁾	345	10	10	840	7.6	7.6	668.4	5906675432052
R-KER-II-400-W ¹⁾	400	10	10	560	8.2	8.2	489.2	5906675432069

¹⁾ ETA-17/0594